Comprehensive, Optimal Manpower Personnel Analysis Support System (COMPASS)

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Navy Personnel Research, Studies, & Technology

The ~~Mission~~ Problem

NPRST

Right Person

Right Place

Right Time

...if

Right Resources

are available

Supply Chain Management Model

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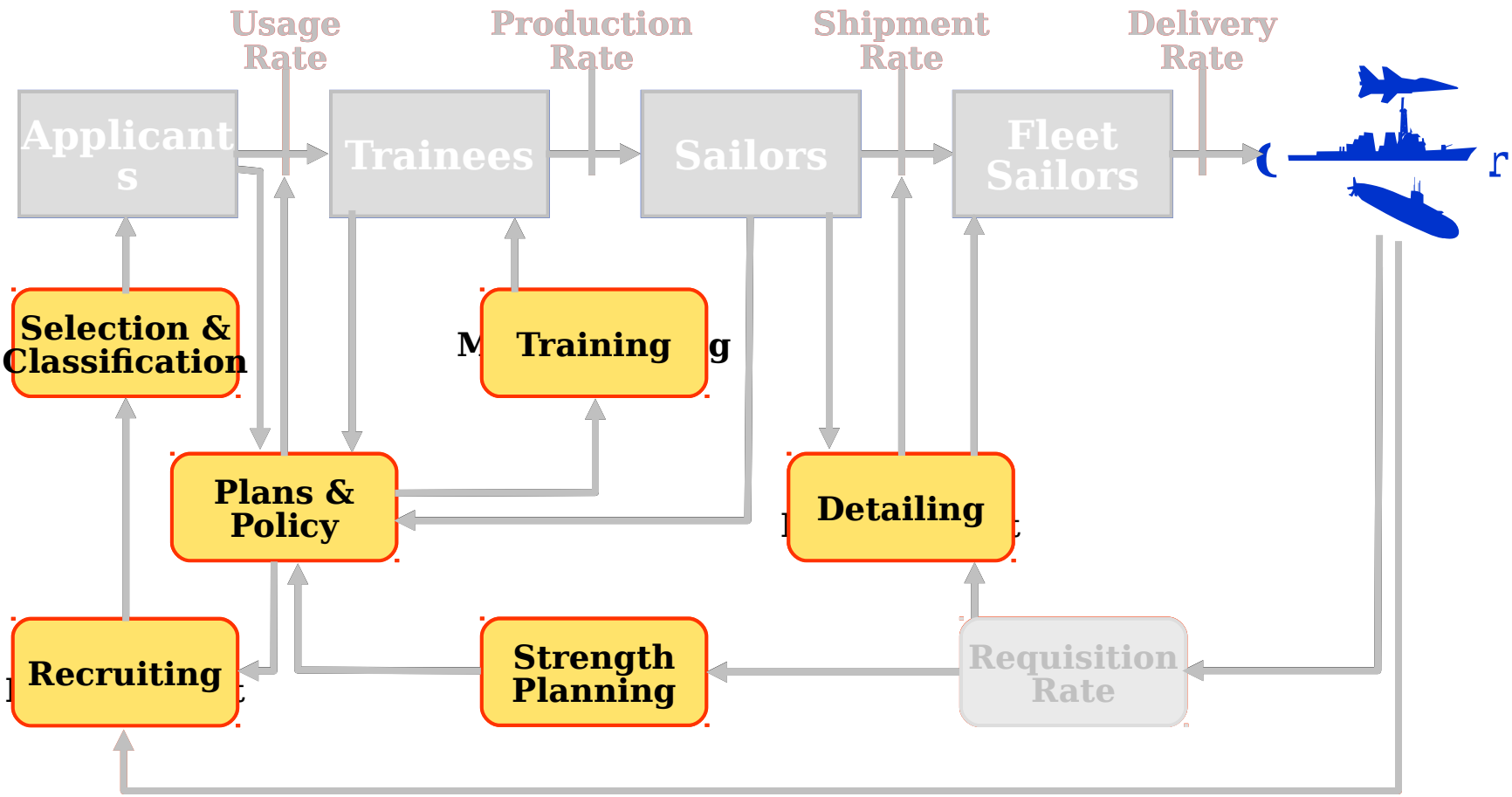
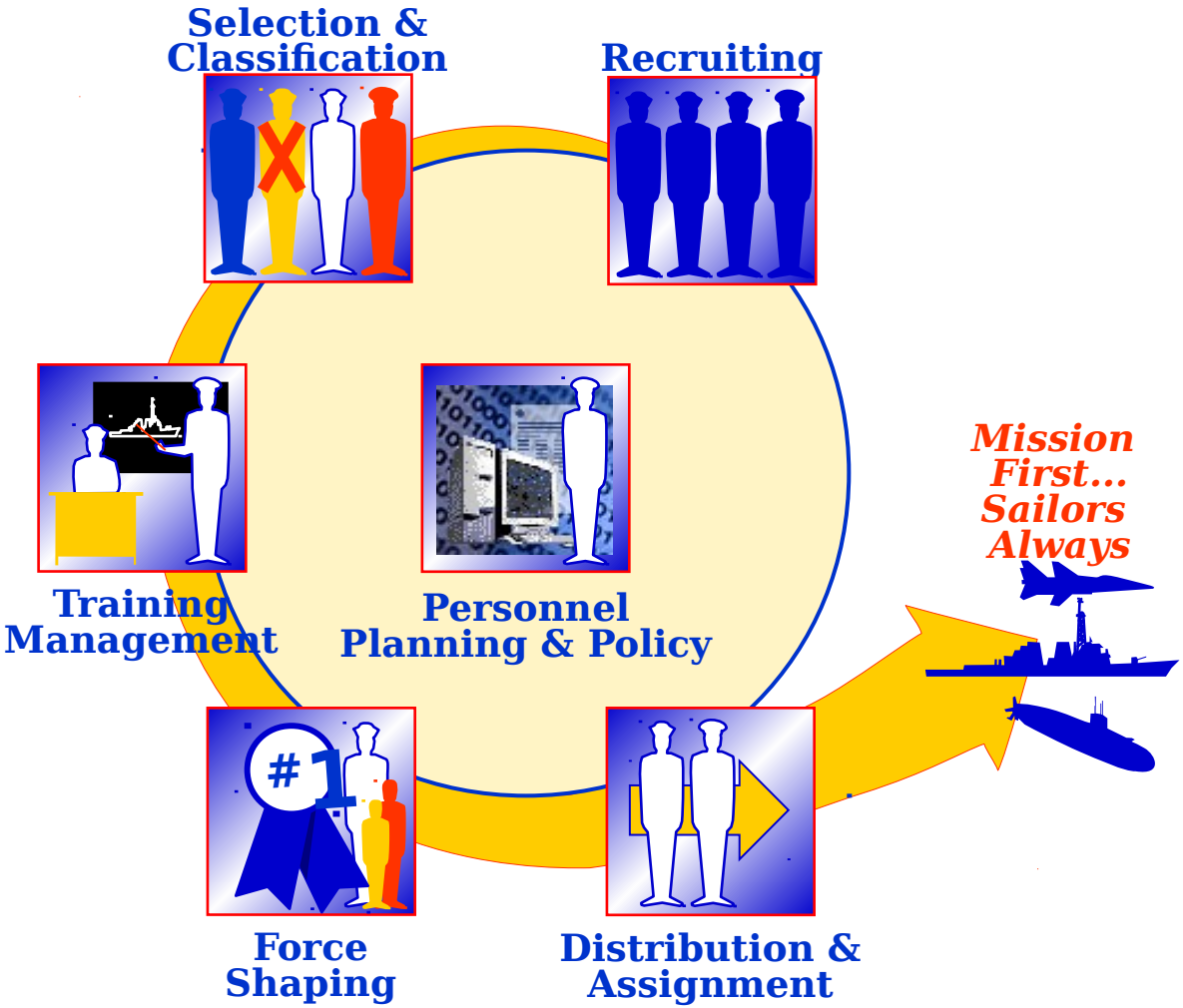


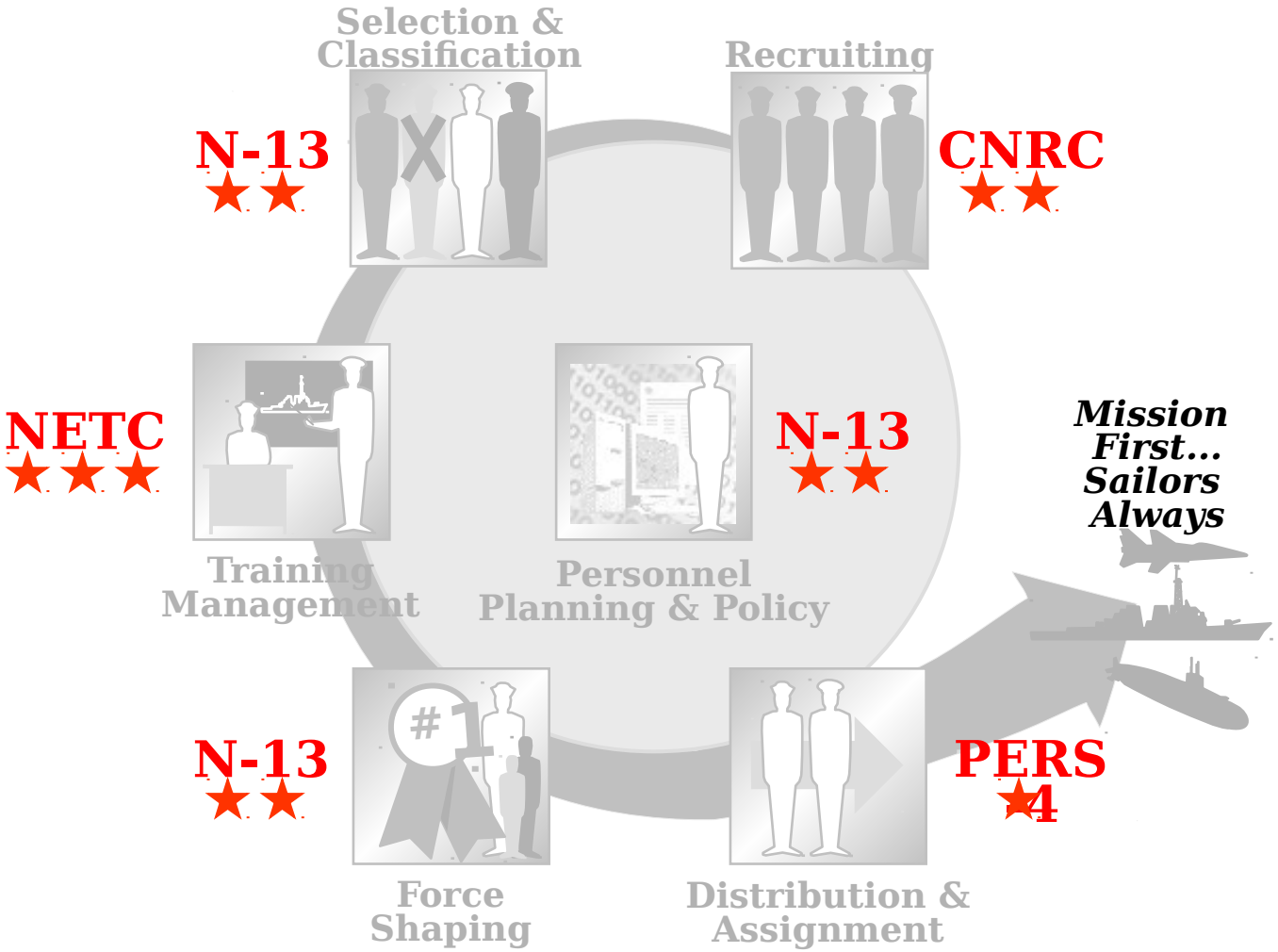
Navy Manpower and Personnel Supply Process

NPRST



Navy Manpower and Personnel Supply Process - Organization

NPRST



Navy Manpower and Personnel Supply Process - Success Stories

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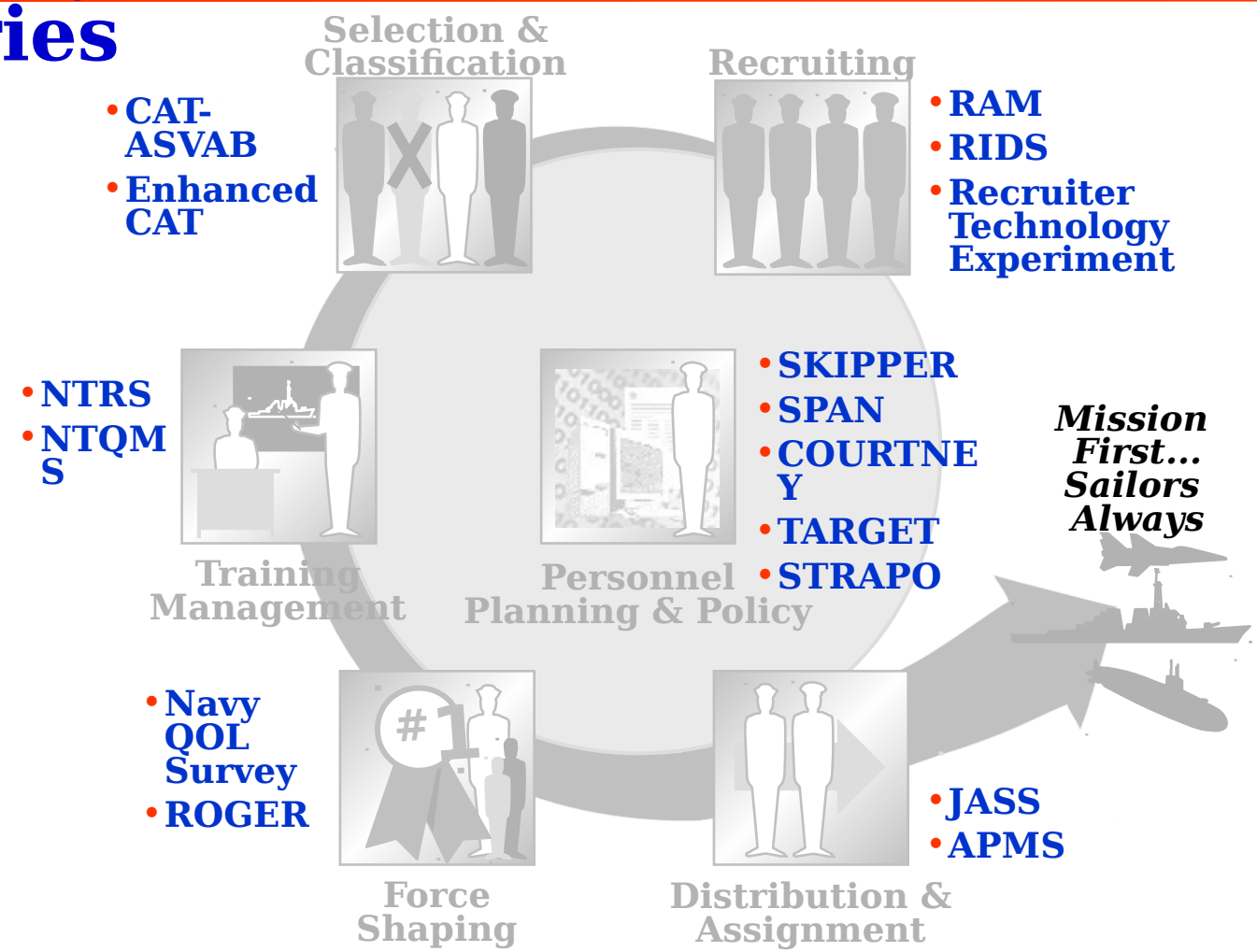

Current Modeling Limitations

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- **Integration of local policy effects**

  Negotiations between local decision makers

  Local versus enterprise performance goals

- **Poor feedback accounting**
- **Evaluation and management of unintended consequences**
- **Inadequate response to unforeseen events**

Modeling Objectives

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- **Advanced “early warning” system**

  Identify potential problems and opportunities

- **Executive flight simulator**

  “What-if” analysis to evaluate alternatives

- **Training platform for decision makers**

  Facilitate in-depth understanding of the enterprise

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- **Think of a BG Commander's situation room**

  Many sensors, weapons, decision aids

- **Extend the analogy to the Navy's personnel environment**
- **Consider internal and external threats**
- **We have good decision aids …but inadequate detection and "early warning" capability**

Strategic Planning Model -- Recruiting @ 8 months

- Personnel Planning & Policy
  - Recruiting
  - Selection & Classification
  - Training Management
  - Force Shaping
  - Distribution & Assignment
- Fleet

Recruiting

Selection & Classification

Training Management

Career Development

Distribution & Assignment

Value 1: $ M	Value 2: $ M
Value 3: Years	Value 4: Years
Value 5: Sailors	Value 6: Sailors

Analysis:

Start Da DD/MM/YYYY

End Da DD/MM/YYYY

Strategic Planning Model -- Detail of Recruiting @ 8 months

- Personnel Planning & Policy
  - Recruiting
    - Recruiter Manning
    - Marketing $$
    - DEP Attrition
    - Upper Mental Group %
    - HS Grad %
    - TAD
    - Other
  - Selection & Classification
  - Training Management
  - Force Shaping
  - Distribution & Assignment

Recruiter Manning	
Marketing $$	DEP Attrition
Upper Mental Group %	High School Graduate %
TAD	Other

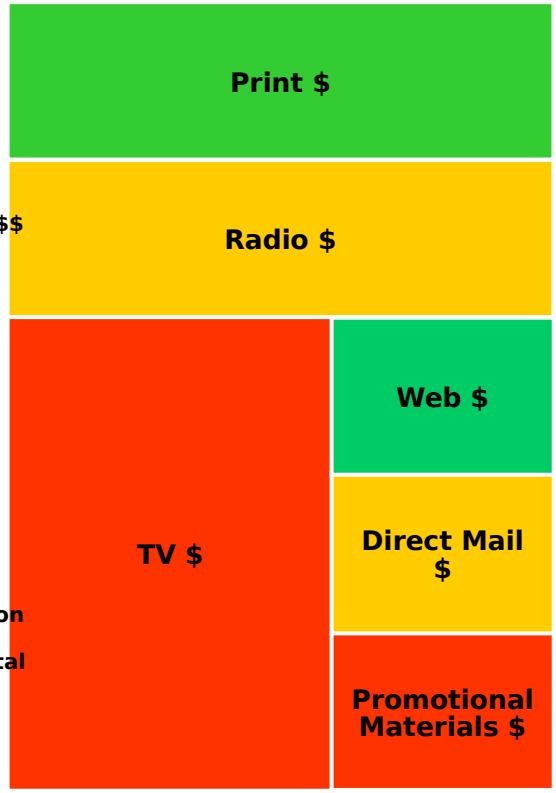
Value 1: $ M	Value 2: $ M
Value 3: Years	Value 4: Years
Value 5: Sailors	Value 6: Sailors

Analysis:

Start Da DD/MM/YYYY — End Da DD/MM/YYYY

Strategic Planning Model -- Drill down of Marketing $$ @ 8 months

- Personnel Planning & Policy
  - Recruiting
    - Recruiter Manning
    - Marketing $$
      - Print
      - Radio
      - TV $
      - Web $
      - Direct Mail $
      - Prom
    - DEP Attrition
    - Upper Mental Group %
    - HS Grad %



Value 1: $ M	Value 2: $ M
Value 3: Years	Value 4: Years
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Analysis:

Start Da DD/MM/YYYY — End Da DD/MM/YYYY

Strategic Planning Model -- Recruiting @ 20 months

- Personnel Planning & Policy
  - Recruiting
  - Selection & Classification
  - Training Management
  - Force Shaping
  - Distribution & Assignment
- Fleet

Recruiting

Selection & Classification

Training Management

Career Development

Distribution & Assignment

Value 1: $ M	Value 2: $ M
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Analysis:

Start Da DD/MM/YYYY

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Technical Approach

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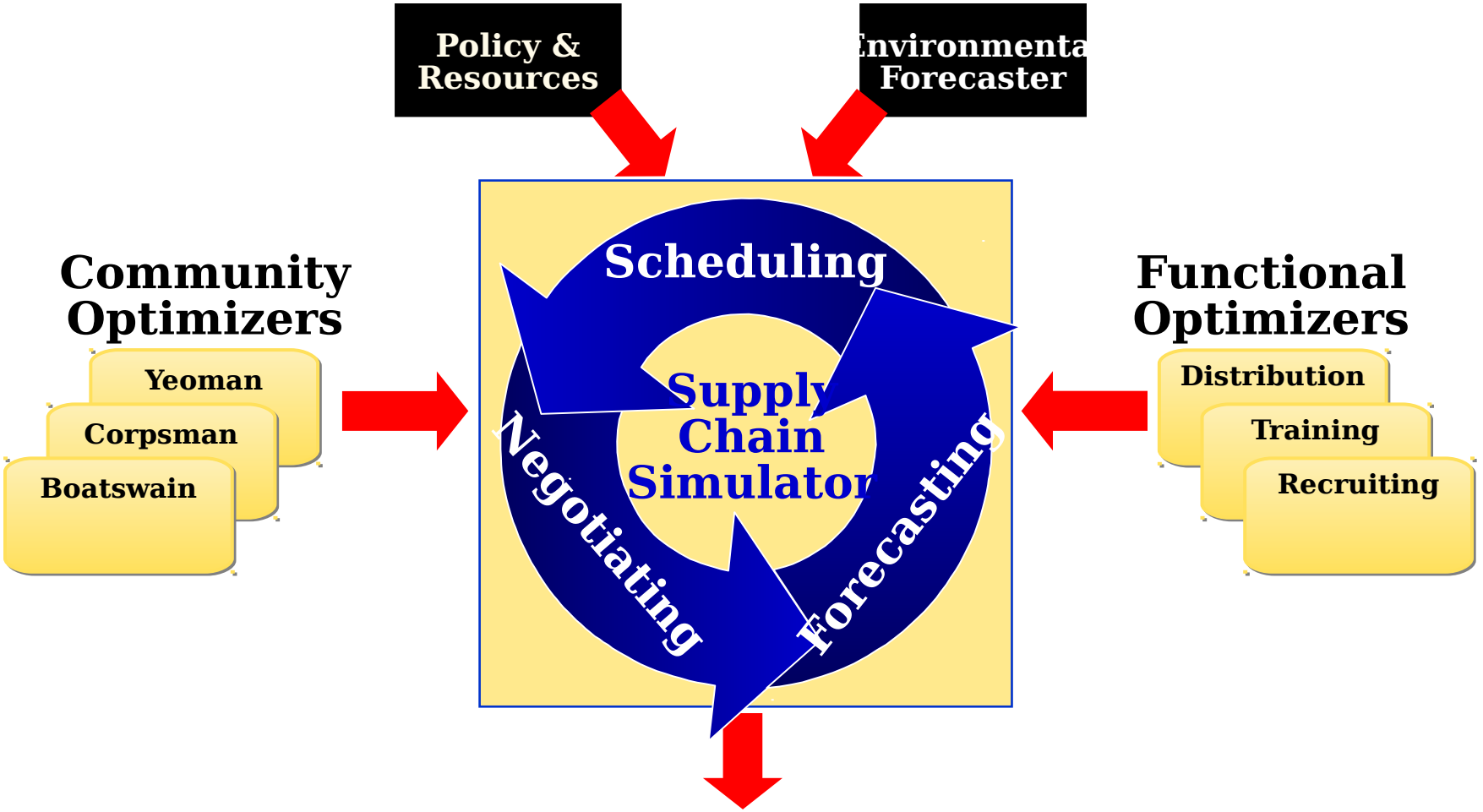

Simulation Attractors

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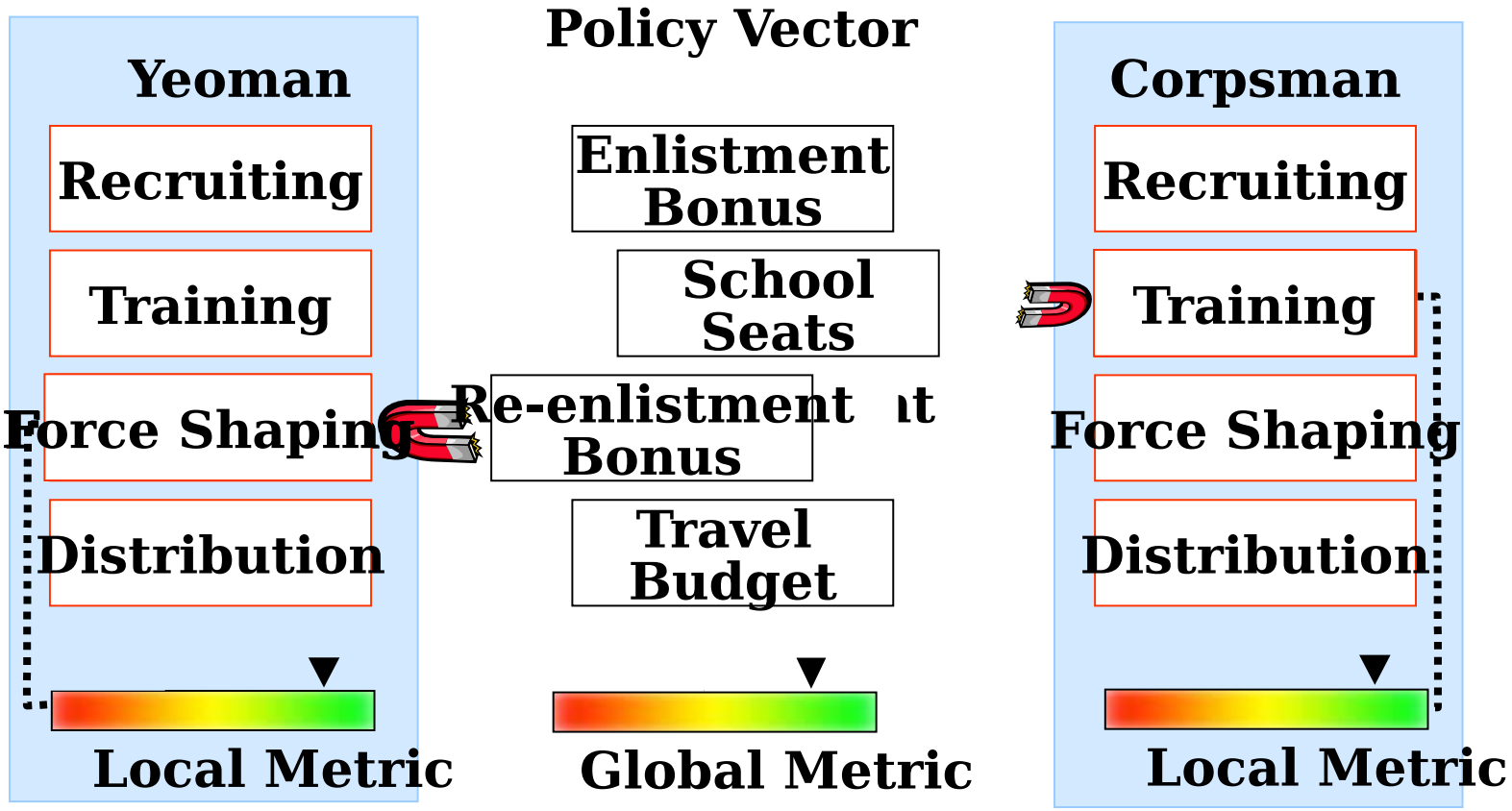

ABM Strengths

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- **Simulates interactions between individuals/groups**
  - **Manages feedback and negotiations**
  - **Multi-level and multi-theoretic**
  - **Credibly simulates behavior**
- **Adapts to unexpected events and unintended consequences**
- **Identifies emergent behaviors**

Science and Technology

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- **Collective optimization through influence networks**

  Adaptive behaviors

- **Cooperation and competition behaviors in systems**

  Local versus global goals

- **Dynamic analysis of non-linear systems**

  Models of Navy Compensation (MODCOMP)

- **Integer/mixed integer optimization**

  Small Business Technology Transfer (STTR)

Technical Barriers

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- **Simulation, optimization and forecasting integration**

  Efficiency versus effectiveness

- **Agent task decomposition, distribution and coordination**

  Division/hierarchy of agent roles

- **Agent communications and negotiations**

  1000s of agents communicating simultaneously

- **Scalability**

  Technical limits on number of agents

Progress to Date

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- **Systems dynamics model developed**
- **Agent model architecture developed**
  - **Functional decision trees tested**
  - **Policy vector parameters developed**
- **Leveraging STTR**
- **Leveraging Enlisted Manpower & Personnel Integrated Planning System (EMPIPS)**

Return on Investment

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Wal-Mart

	+ Revenue	+ Profit
1995	12%	14%
1996	11%	16%

Proctor & Gamble

$1 Billion less inventory without increased backorders

Baxter HealthCare

15% system cost reduction

Navy Personnel Enterprise: $5.4 billion

Each 1% improvement represents $34M in

Project Team

Principal Investigator – David Cashbaugh

Functional Sponsor – Steve Cylke (N-13T)

Associate Researchers – Ross Andrews
Ilia Christman
Kimberly Crayton
David Dickason
Rodney Myers

Contractor Support – Industrial Science Corporation
Computer Science Corporation
Altarum

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